

## Three new legless lizards (Pygopodidae) from Western Australia

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### Abstract

The new taxa are *Delma butleri*, *Delma haroldi* and *Aclys concinna major*. *D. butleri* is widespread in southern Australia but was previously confused with *D. nasuta*, which is redescribed. *D. haroldi* occurs in the northern arid zone of Western Australia and is readily distinguished from its congeners by coloration; it alone has narrow pale bands across the head and neck but no broad dark bands. *A. c. major* is an addition to the considerable number of reptiles endemic to the Shark Bay region.

### Introduction

In his monograph of the Pygopodidae, Kluge (1974: 110) observed that southern specimens of *Delma 'nasuta'* differed from northern specimens, but he believed that the two forms were connected by clines. Recent collections, notably by the Western Australian Museum's Department of Biogeography and Ecology, the Western Australian Wildlife Centre, and amateur herpetologists financed by grants from Mr and Mrs W.H. Butler to the Museum, have demonstrated sympatry between *D. nasuta* and the southern form, herein described as a new species.

Among the numerous specimens of '*Delma borea*' in the Western Australian Museum were ten that differed from true *borea* markedly and consistently in coloration. They too are described as a new species.

Kluge had only two specimens when he described the genus *Aclys* and its single species. Since then the Western Australian Museum has received another 89 specimens, which permits an evaluation of individual and geographic variation in *A. concinna*. Precisely as in *Pletholax*, the other pygopodid genus endemic to south-western Australia, *A. concinna* proved divisible into northern and southern subspecies separated by c. 350 km of well-collected country, from which the species is almost certainly absent.

Kluge departed considerably from the standard nomenclature of lizard head scales. In this paper (and in a forthcoming book on the gekkonid and pygopodid lizards of Western Australia) I return to a more traditional usage and call the scales immediately above and behind the nostril supranasal(s) and postnasal respectively, and I count as loreals all the small scales between the postnasal and ring of ocular scales.

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This paper is based on material in the Western Australian Museum. Except for holotypes the R suffix is omitted from register number of specimens.

### Systematics

#### *Delma butleri* sp. nov.

#### Figure 1

##### Holotype

R76742 in Western Australian Museum, collected by G. Harold and C. Winton on 22 May 1982 at 5 km SE Gnaraloo, WA, in 23°52'S 113°32'E.

##### Paratypes

The 97 specimens listed under Material examined.

##### Diagnosis

A small *Delma* without dark or pale bands across top of head and neck. Distinguishable from *D. nasuta* by fewer and differently patterned loreals, shorter and darker snout, dark brown upper labials variably marked with white (rather than brownish white, narrowly edged above with dark brown), dorsals dark brown finely edged with blackish (rather than pale brown, spotted dark brown) and ventrals and subcaudals never dark-edged. Distinguishable from *D. grayii*



Figure 1 Holotype of *Delma butleri*, photographed in life by G. Harold.

by finely dark-edged dorsals and little or no development of ventrolateral vertical barring behind ear.

### Description

Snout-vent length (mm): 36-91 (N 98, mean 69.7). Tail (% SVL): 245-345 (N 34, mean 300.6). Two pairs of supranasals, posterior occasionally much the larger. Loreals 3-9 (N 98, mean 6.0). Upper labials 6 with fourth under eye (N 83) or 7 with fifth (3). Midbody scale rows 15 (N 2), 16 (57), 17 (13) or 18 (11).

Upper surface brown tinged olive, all scales finely dark-edged. Lores, lips, temples and side of neck variably marked with pale brown, dark brown and white, the white taking form of spots, blotches, or vertical streaks up from white under surface; lores, lips etc. sometimes dark brown and almost entirely without pattern. Lower surface yellow, white, greyish white or brownish white.

### Distribution

Arid and semiarid zones of central and southern Western Australia from Lake MacLeod, the Hamersley Range and Ethel Creek south to Dirk Hartog I., Northampton, East Yuna Nature Reserve, Youanmi, Mt Jackson, Boorabbin, 40 km SE Coolgardie, 30 km NW Heartbreak Ridge and Charlina Rock, and east to Lake Carnegie, White Cliffs and Zanthus; also northern South Australia. Mainly found in spinifex (*Triodia* and *Plectrachne* spp.) on sandy and loamy soils. See map, Figure 2.

### Geographic variation

From north-west to south-east there is a slight reduction (90-79 mm) in maximum snout-vent length and in strength of colour pattern on side of head and neck, and ventral coloration changes from yellow to whitish. For differences between the strongly-patterned north-western populations and weakly-patterned south-eastern populations, compare the photograph of the holotype with the South Australian specimen of '*nasuta*' in Kluge (1974: 111, Fig. 71).

### Derivation of name

After naturalist W.H. (Harry) Butler, who was first to collect this species for the Western Australian Museum (on 30 December 1961 at Queen Victoria Spring).

### Material examined

#### *North-West Division (WA)*

Marandoo (94585); 16 km N Ethel Creek HS (28359); 3 km SE Gnarlloo (76645); Dirk Hartog I. (45850, 57087-8, 57093-4); 25 km SSE Denham (54556).

#### *Eastern Division (WA)*

9 km SW Mt Lockeridge (64727); 33 km W Carnegie (21073); 22 km SE Mt Keith (62822) and 29 km SE (78553) and 30 km SSE (78548); 7 km WNW Point Salvation (85605-6); 9 km SSE Banjarnawarn (74784) and 12 km SSE (69288); 17 km NE Youanmi (86658); 27 km NE White Cliffs (53291) and 15 km E (85305); Ivor Rocks (53255-6); 39 km ENE Laverton

(85600-1, 85603-4); Mt Windarra (70876-7); 35 km SSE Dandaraga (67974); 24 km ENE Yuinmery (74677, 74679) and 8-9 km ENE (69080, 69104, 69108, 74658); Blue Hill (64794, 64813-4); 3 km NE Comet Vale (72669, 72728); Queen Victoria Spring (18531) and 53 km NNE (94077); near Mt Manning Range (64754-5, 78680, 78688-9); 75 km N Kalgoorlie (53277); 15 km NE Bungalbin Hill (67188); 16 km SSW Mt Jackson (76121); Yowie Rockhole (70893) and 6 km ENE (73212, 73228-9); 4 km E Zanthus (91510); near Buningtonia Spring (65531, 65539, 65569-70, 65590, 65654, 72503, 72537, 74557, 74591, 74597); near Boorabbin (72248, 72255-6, 72285-6, 72291); 32 km S Woolgangie (71775); 30 km NW Heartbreak Ridge (65463, 65484).

*South-West Division (WA)*

44 km NE Yuna (57541) and 40 km NE (57522); Northampton (47709); East Yuna Nature Reserve (48184-8, 48261, 48270, 75559).

*Eucla Division (WA)*

Newman Rock (53459-60); 4 km E Boingaring Rocks (57959, 58072); 17 km N Charlina Rock (59854-5).

*South Australia*

56 km NW Mt Lindsay (44362); 43 km NE Maralinga (36649).

### *Delma nasuta* Kluge

*Delma nasuta* Kluge (1974: 109-113). Pollock Hills, WA.

#### Diagnosis

A moderately large *Delma* without dark or pale bands across top of head and neck. Distinguishable from *D. butleri* by more numerous and differently patterned loreals, longer and paler snout, pale brown upper labials narrowly edged above with dark brown, dorsals pale brown spotted with dark brown, and ventrals and subcaudals often dark-edged.

#### Description

Snout-vent length (mm): 46-112 (N 157, mean 85.4). Tail (% SVL): 251-412 (N 36, mean 328.4). Two pairs of supranasals, posterior usually much the larger. Loreals 4-23 (N 155, mean 11.8). Upper labials 5 with third under eye (N 3), 6 with fourth (119), 7 with fourth (1), 7 with fifth (25) or 8 with sixth (1). Midbody scale rows 15 (N 1), 16 (60), 17 (24), 18 (48) or 20 (1).

Upper surface pale brown, palest on snout and darkest on crown; dorsals and supracaudals with a dark brown apical spot, sometimes a basal spot and rarely a median bar. Loreals usually bicoloured, i.e. each scale anteriorly and inferiorly pale brown or brownish white, and posteriorly and superiorly dark brown. Upper labials pale brown or brownish white, edged above with dark brown. Lower surface white, the ventrals and subcaudals anteriorly edged or not with pale or dark brown.

#### Distribution

Arid and semiarid zones of northern and central Western Australia from southern Kimberley south to Shark Bay (Edel Land and Peron Peninsula), Erlistoun, Point

Salvation and the Cavenagh Range, including Hermite and Barrow Is; also arid and semiarid interior of Northern Territory north to the upper Victoria River drainage (Spring Creek), far western interior of Queensland and extreme north of South Australia. Inhabiting spinifex (*Triodia* spp.) on sandy, clayey and stony soils. See map, Figure 2.

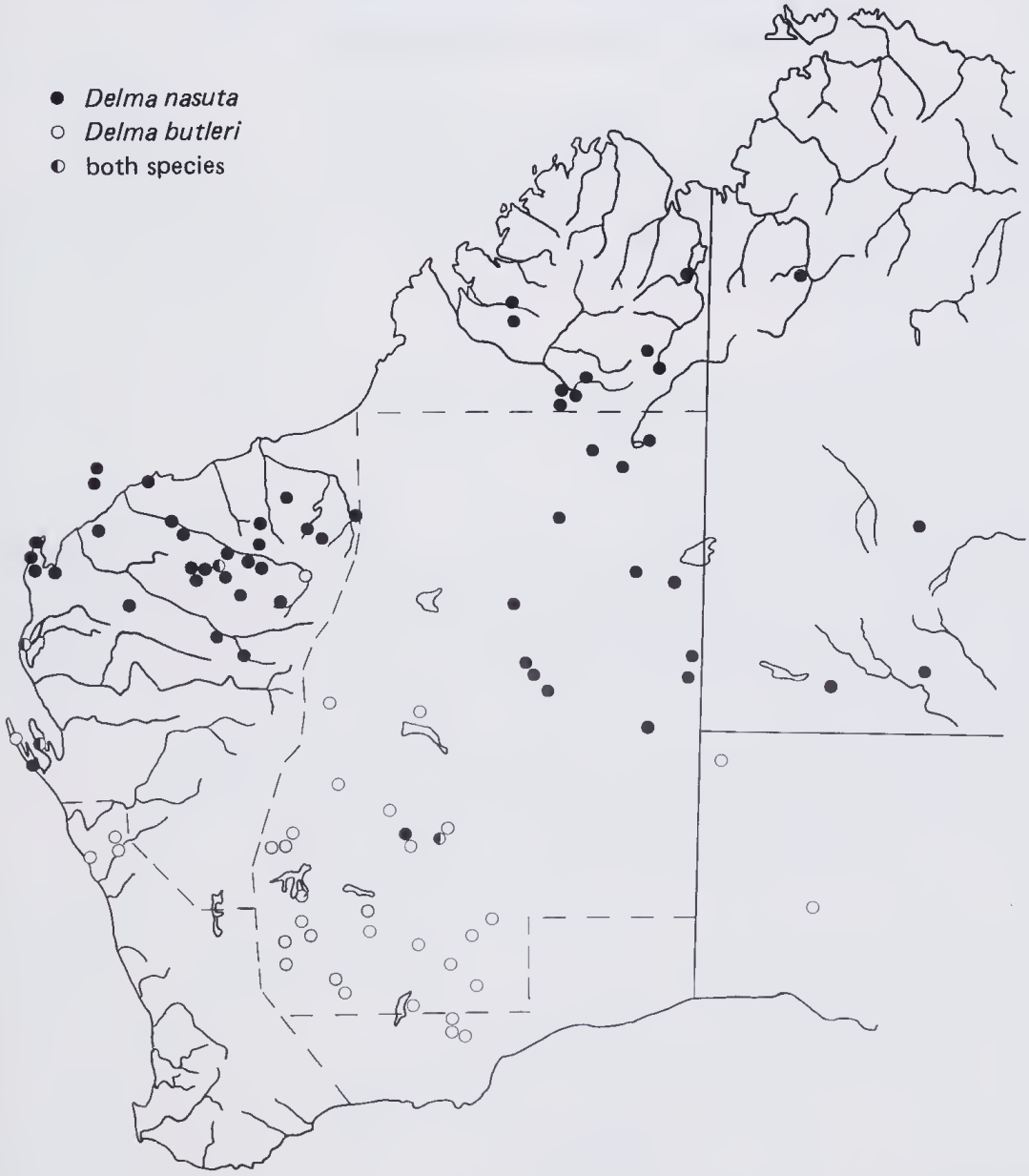


Figure 2 Map of western half of Australia, showing location of specimens of *Delma butleri* and *Delma nasuta*.

## Geographic variation

In the far north (Kimberley Division and Victoria River drainage) the ventrals and often the subcaudals are immaculate. Southwards there is a steady increase in the frequency of specimens with dark-edged ventrals and/or subcaudals, so that within the range of *D. butleri* almost all specimens are thus marked.

## Remarks

For photographs of the head of a *Delma nasuta* see Kluge (1974: 112, Fig. 72).

## Material examined

### *Kimberley Division (WA)*

11 km NNW Mt Evelyn (70953); 11 km WSW Lissadell (70411); 3 km E Yammera Gap (56436) and 12 km ESE (57318); 6 km S Mt Percy (70034, 70637); Halls Creek (26638, 83567-8, 87117-20) and 8 km NE (87121-2) and 43 km SE (23060); 25 km E Bohemia Downs (23049); 3 km W Christmas Creek HS (25590); Bull Flat Bore (51264-5); Wattle Creek Spring (51284); 58 km SSW Christmas Creek HS (45984).

### *North-West Division (WA)*

Hermite I. (37405); Barrow I. (27611-2, 28453, 28655, 47853, 48563-615, 56709-10); 20 km W Karratha (75118); Myaree Pool (61576-7); Marble Bar (67604, 67610); Woodstock (14782, 27610); Millstream (20110); Mt Ulric Gorge (20112); Asbestos Gorge (20111); Woodie Woodie (63147); Nullagine (64700); 4 km N Palm Springs (63131); 5 km ENE Kurrana Well (73953-4); Cattle Pool (61600); 8 km NW Cane River HS (80598) and 5 km WNW (96541); Chichester Range (31484); Noreena Downs (37018); Yardie Creek Station (13195); 9 km N Yardie Creek watercourse (61042-4); 40 km NE Ningaloo (21773); 3 km E Giralia (61425); Dales Gorge (14806-7); Marandoo (54380, 59709, 60494); Tom Price (42996) and 18 km SSW (76565) and 22 km W (73741); 18 km NW Juna Downs (69780-1) and 9 km W (81296); 24 km SW Marillana (70752) and 22 km SW (70750) and 22 km W (73741) and 18 km SSW (76565); 31 km SE Mt Meharry (63626, 64829); Mt Newman (26547); 21 km NW Ullawarra (25261) 5 km SE Gnaraloo (76743); 28 km NW Mt Vernon HS (25230); Nichol Spring (22806); 25 km S Denham (54555, 54694); False Entrance Well (74950).

### *Eastern Division (WA)*

Balgo Hill (63276); Bungabiddy Well (64055); Godfrey Tank (63410); Bishop Range (69896-8); Well 39 (64160, 64210); Tobin Lake (63465); 80 km S Telfer (94766); Pollock Hills (40178 holotype); Dover Hills (45240); 48 km W Windy Corner (45277); Walter James Range (45241), 57 km E Giles (20770) and 37 km SE (20751); Charlies Knob (53601-2); 33 km W Browne Range (21043); near Young Range (78127); near Baker Range (78123); Cavenagh Range (20735); 7 km WNW Point Salvation (85607); Erlistoun (70832); Ivor Rocks (53253-4).

### *Northern Territory*

Spring Creek, 58 km N Wave Hill (60234-6); 10 km SW Barrow Creek (24353-4); Maryvale (55348, 55398); Angas Downs (20816).

## *Delma haroldi* sp. nov.

Figure 3

## Holotype

R85094 in Western Australian Museum, collected by G. Harold and C. Winton on 11 August 1983 at 11 km NNW Uaroo, WA, in 22°41'S, 115°20'E.

### Paratypes

#### *Kimberley Division (WA)*

146 km E McLarty Hills (46043).

#### *North-West Division (WA)*

Wallal (45811); 2 km SW Barradale (51722); Marandoo (64715); 14 km SW The Governer (63632); Ophthalmia Range (73630).

#### *Eastern Division (WA)*

Balgo Mission (64703); Twin Heads (63427); 45 km N Windy Corner (45243).

### Diagnosis

A small *Delma* with two pairs of supranasals, fourth upper labial below eye, usually 16 midbody scale rows, and with very narrow pale bands on head and neck but no dark bands. Most like faintly patterned examples of *D. borea* but distinguishable by pale bands on head and neck being wavy (rather than straight), by additional pale band(s) on side of head between postocular and auricular bands, and by dark spot at apex of anterior dorsals.

### Description

Snout-vent length (mm): 48-75 (N 10, mean 62.4). Length of tail (% of SVL): 314-369 (N 4, mean 347). Two pairs of supranasals, anterior in contact with each other (N 8) or separated (2). Loreals 5-7 (N 10, mean 5.4). Fourth upper labial under eye (N 9) or fifth (1). Midbody scale rows 16 (N 9) or 18 (1).



Figure 3 A paratype of *Delma haroldi* from Marandoo, photographed in life by G. Harold.



Figure 4 Map of Western Australia, showing location of specimens of *Delma haroldi*, *Aclysinna major* and *Aclysinna concinna*.



Top of head and neck dark brown, occasionally mottled with pale brown. On back of head and on neck a narrow, brownish white or pale brown band, each becoming whiter and broader as it descends to lower surface, the anterior forking at ear aperture; 3 or 4 additional pale bands on side of head, one passing over loreals, one over postoculars and one (occasionally 2) over temple. Remaining upper surfaces pale brown, each scale edged with dark brown, margin thickest at apex of anterior dorsals. Labials marked with dark brown and white. Sides of body and tail paler than dorsum except for dark apical spot on each scale; side of forebody marked with narrow white or brownish white vertical bands, the first occasionally joining its opposite number, the rest decreasing in height backwards; these bands (like those on side of head) irregularly edged with dark brown. Lower surface white.

#### Distribution

Northern arid zone of Western Australia between latitudes 19°25' and 23°15'S. See map, Figure 4.

#### Derivation of name

After naturalist Gregory Harold, co-collector of the holotype.

### *Aclys concinna concinna* Kluge

*Aclys concinna* Kluge (1974: 46-48). Sorrento, WA.

#### Diagnosis

A relatively small (total length 177-496 mm, N 42) and pale subspecies with dorsal pattern consisting mainly of three blackish lines or series of spots; venter white or pale grey, occasionally with pale brown spots.

#### Description

Snout-vent length (mm): 37-101 (mean 69.5, N 87). Length of tail (% SVL): 302-450 (mean 377, N 42). Two pairs of supranasals, the anterior narrowly to widely separated from each other (N 81), in point contact (2) or forming a short or moderately long suture (N 2). Anterior frontal slightly to much larger than posterior (N 70), its apex cut off in two specimens to form a small azygous scale. Supraoculars 2, anterior larger (N 86). Supraciliaries 2 (N 2, when second and third fused) or 3 (84), second largest. Postnasal occasionally separated from anterior supranasal. On both sides of one specimen supraloreal horizontally divided towards apex. Loreals 1 (N 1), 2 (1), 3 (41), 4 (37), 5 (3) or 7 (1). Upper labials 6 with fourth largest and subocular (N 4), 7 with fourth (60), 8 with fourth (1), 8 with fifth (4) or 9 with fifth (1); last smallest except on few occasions when fused to penultimate. Midbody scale rows 18 (3), 19 (11), 20 (39), 21 (4) or 22 (3).

Upper surface brownish grey, head darkest and brownest along contact with white labial stripe; occasionally a darker, broad, median stripe on back c. 4 scales wide, contrasting with narrow pale laterodorsal stripe (thus approaching condition in next subspecies), overlaying but not concealing 3 blackish brown, longitudinal lines or series of spots on back (less distinct on tail). Sides of body and tail pale brownish grey with one or more longitudinal series of darker spots, less distinct than those on dorsum. Lips, chin and throat white. Rest of under surface white or very pale grey, breast and abdomen occasionally and undertail always spotted pale brown (one spot per scale). See photograph in Kluge (1974: 47, Fig. 17).

### Distribution

Lower west coast of Western Australia between lat. 29°50' and 31°50'S, inland to Badgingarra and Cataby. See map, Figure 4.

### Material examined

#### *South-West Division (WA)*

5 km E Coolimba (72983), 5 km E Leeman (85015); near Mt Peron (48809, 49123, 59644, 61295-6, 64718-21); near Coomallo Hill (41156); Badgingarra (64722) and 30 km WSW (60018-20, 60026-7) and 22 km S (60021-3, 60512); Badgingarra Nat. Park (68408-42, 68846, 68848-69, 68472-9, 68711-2); Cataby (51729); Yanchep Nat. Park (59132); Sorrento (17312, holotype).

## *Aclys concinna major* subsp. nov.

### Figure 5

#### Holotype

R66192 in Western Australian Museum, collected by T.M.S. Hanlon and G. Harold on 29 August 1979 at 2 km N Tamala, WA, in 26°40'S, 113°43'E.

#### Paratypes

#### *North-West Division (WA)*

7 km NE Tamala (96898, 97010).

### Diagnosis

A relatively large (total length 538-542 mm, N 2) and dark subspecies of *A. concinna* with dorsal pattern consisting of a broad, blackish, longitudinal stripe; venter white, spotted with dark brown.

### Description

Snout-vent length (mm): 100-112 (N 3). Length of tail (% SVL): 398-438 (N 2). Two pairs of supranasals, anterior separated. Anterior frontal larger than posterior. Supraoculars 2, anterior larger or subequal. Supraciliaries 2 or 3. Postnasal and supraloreal present. Loreals 3-5. Upper labials 7 with fourth subocular (N 2) or 8 with fifth (1), last smallest. Midbody scale rows 20.

Head dark brownish grey. Broad, blackish brown, median stripe on back 3-4 scales wide, becoming narrower and paler posteriorly. Narrow laterodorsal

stripe pale brownish grey. Lateral scales brownish grey, edged brownish white. Chin and throat white. Breast and abdomen white, each scale with a dark greyish brown or blackish brown triangular spot. Subcaudals greyish brown, edged greyish white.



Figure 5 Holotype of *Aclysa concinna major*, photographed in life by G. Harold.

### Distribution

Known from only one locality near mid-west coast of Western Australia. See map, Figure 4.

### Remarks

This is one of several lizards endemic to the Shark Bay region. Others include the pygopodids *Aprasia haroldi* and *Pletholax gracilis edelensis*, the agamid *Tympanocryptis butleri* and the skinks *Ctenotus youngsoni*, *Egernia stokesii aethiops*, *Lerista varia* and *Menetia amaura*.

### Reference

Kluge, A.G. (1974). A taxonomic revision of the lizard family Pygopodidae. *Misc. Publs Mus. Zool. Univ. Mich.*, No. 147.